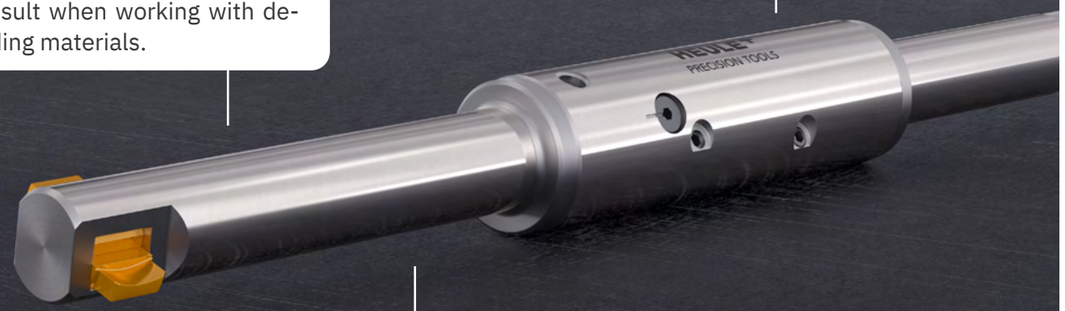
# DEFA

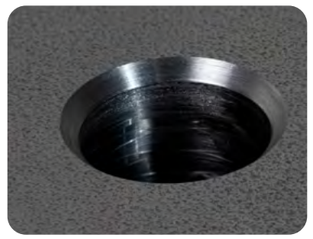
Adjustable chamfering of interrupted bore edges – for high burr formation or materials that are difficult to machine.

## The advantages – Your benefit

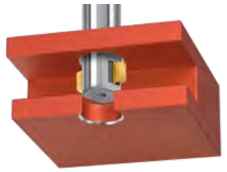
The operating principle specific to the DEFA and the special blade geometry ensure a reliable chamfer result when working with demanding materials.

The chamfering capacity is infinitely adjustable on the tool itself, depending on the bore diameter. The cutting force can also be optimised to suit the material.



Double-edged tool for chamfers with precise diameters and high-quality chamfered surfaces.



Chamfering of interrupted bore edges – forward and backward in a single operation.



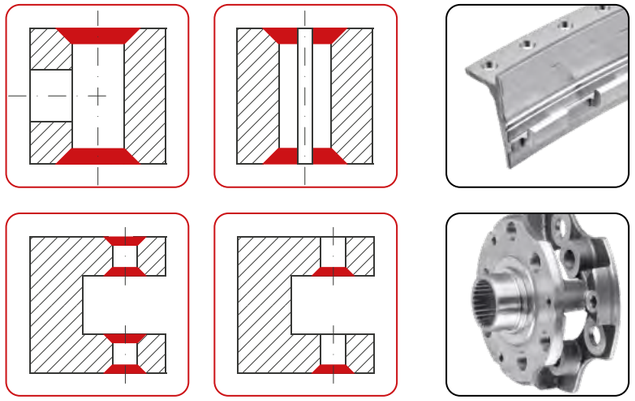

## THE RANGE

| Bore Ø range mm | Max. chamfer range mm | Working length mm | Series | Catalogue Page |
|---|---|---|---|---|
| Ø4.0–6.6 | 0.1–0.6 | 30.0 / 60.0 | DEFA 4–6 | 112 |
| Ø6.0–10.1 | 0.1–0.85 | 34.0 / 60.0 | DEFA 6–10 | 114 |
| Ø9.0–23.9 | 0.1–2.0 | 30.0 / 60.0 | DEFA 9–24 | 116 |

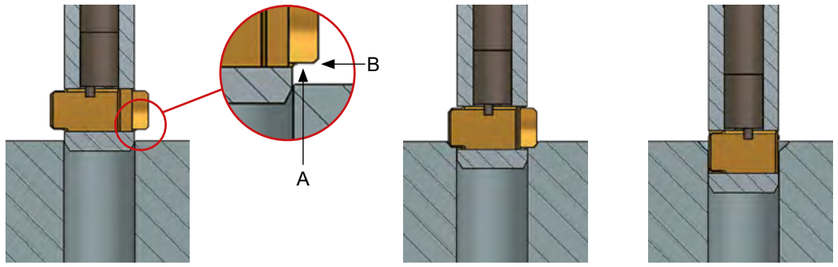
The DEFA range consists of three tool series. The tools in these series are designed to cover a range of bore diameters.

If the required tool is not included in the standard range, our **INDIVIDUAL** range often has a possible solution. If required, we can also develop custom solutions that are fully tailored to your application.

## FIELD OF APPLICATION



# OPERATING PRINCIPLE



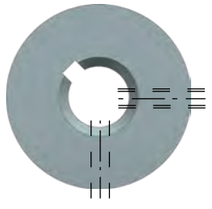

The DEFA chamfering tool is particularly suitable for cutting small to large chamfers to materials with high burr formation.

First, the cutting edges (A) remove the existing burr. As soon as the blades meet the workpiece surface, an inclined, non-cutting control surface on the blade (B) controls the cutting of the chamfer and the retraction of the blade into the tool body.

The crowned surface of the blade passes through the bore without causing any damage to the surface of the bore.

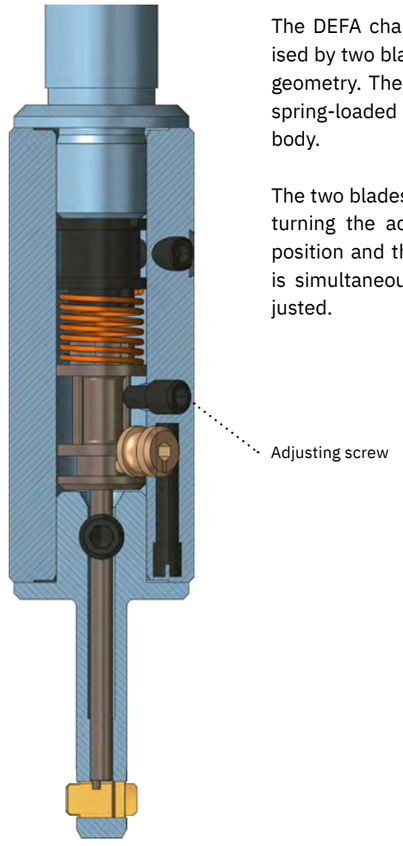
The rigid connection between the two cutting edges also allows bores with axial grooves or cross bores to be machined and to be traversed through in rotation, i.e. without stopping the spindle (see illustration below).

**Compensation of height differences**
DEFA automatically compensates for possible height differences in the components to be machined, e.g. cast parts. The blade only begins to retract or cut on contact with the workpiece. This means that the chamfer size remains constant.



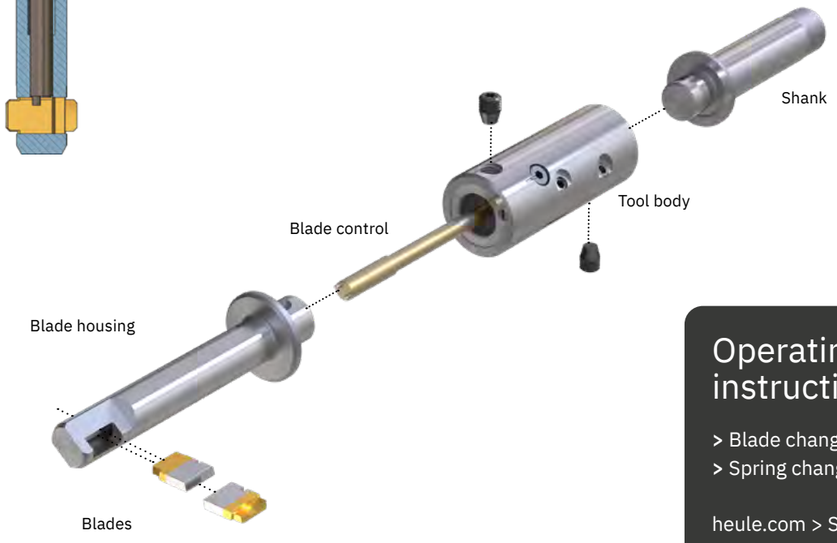
Top view of workpiece with axial groove and cross bores

# TOOL DESIGN




The DEFA chamfering tool is characterised by two blades with a special cutting geometry. The two blades are kept by a spring-loaded blade control in the tool body.

The two blades are rigidly connected. By turning the adjusting screw, the blade position and thus the chamfer diameter is simultaneously and continuously adjusted.




## Operating instructions

> Blade change
> Spring change

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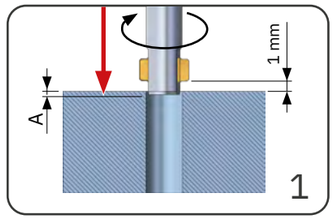
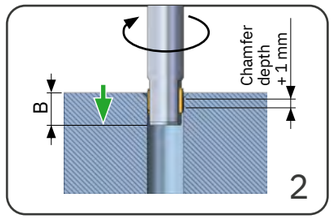
DEFA

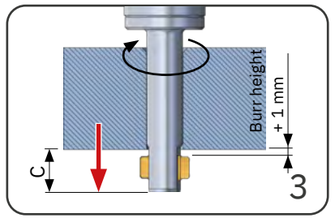
# DEFA PROCESS STEPS




- Rapid feed to position **A** or 1.0 mm distance
- Spindle rotation clockwise
- External coolant on




- Working feed to position **B** or chamfer depth + 1.0 mm




- Rapid traverse to position **C** or burr height + 1.0 mm

**Example**

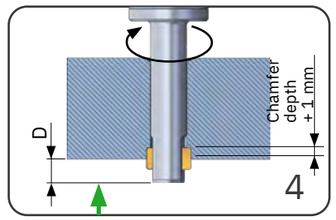
```
G0 Z-2.0
S579 M3
M8
```

```
G1 Z-6.0[1] F17
```

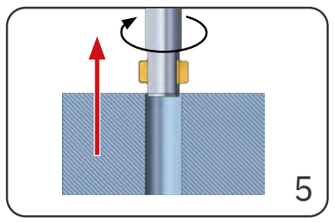
[1] 6.0=3.0+(6.0/2)

```
G0 Z-26.5[2]
```

[2] 26.5=16.5+3.0+6.0+1.0




- Working feed to position **D** or chamfer depth + 1.0 mm




- Rapid feed out of the workpiece

```
G1 Z-22.5[3]
```

[3] 22.5=16.5+3.0+(6.0/2)

```
G0 Z+2.0
```

# DIMENSION TABLE FOR PROGRAMMING

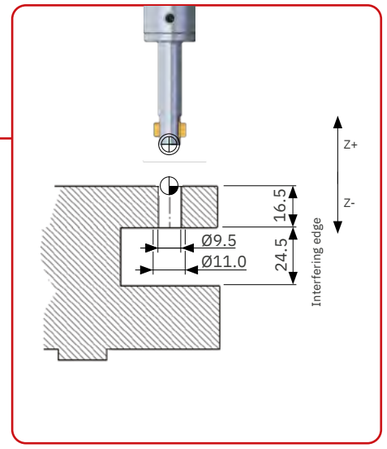
| Tool | A mm | B mm | C mm | D mm |
|---|---|---|---|---|
| DEFA 4–6 | 0.8 | 3.4 | 6.0 | 3.4 |
| DEFA 6–10 | 0.8 | 1.8+(0.5*K[1]) | 1.8+K[1]+1.0 | 1.8+(0.5*K[1]) |
| DEFA 9–24 | 2.0 | 3.0+(0.5*K[2]) | 3.0+K[2]+1.0 | 3.0+(0.5*K[2]) |

[1] Dimensions for K, see tool table page 114
[2] Dimensions for K, see tool table page 116

The cutting data listed are guide values! For materials that are difficult to machine or uneven bore edges, we recommend applying cutting speeds that are at the lower end of the range.



# APPLICATION AND PROGRAMMING EXAMPLE




**Application data**

| | |
|---|---|
| Workpiece height: | 16.5 mm |
| Bore diameter: | Ø9.5 mm |
| Chamfer diameter: | Ø11.0 mm |
| Material: | Titanium |
| Machining: | both bore edges |

**Tool and blade selection**

| | |
|---|---|
| Tool: | GH-S-D-1747 (DEFA 9-24) |
| Tool diameter: | Ø8.8 mm |
| Chamfer diameter range: | Ø10.2–11.4 mm |
| Working length: | 30.0 mm (note interfering edge) |
| Blade: | GH-S-M-3912 (carbide, TiN coated) |
| Setting diameter D2: | D+2S = 11.0 mm + 2(0.4) = 11.8 mm |
| K: | 6.0 mm (see page 116) |

**Cutting data**

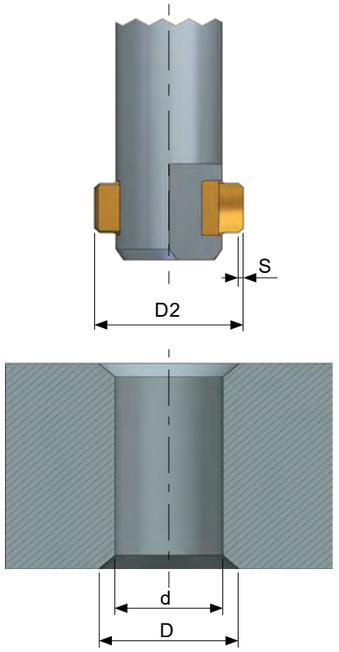
| | |
|---|---|
| Cutting speed Vc: | 10–20 m/min. |
| Working feed fz: | 0.02–0.04 mm/rev. |

# CUTTING DATA

| | Description | Tensile str. RM (MPa) | Hardness (HB) | Hardn. (HRC) | DF geometry | | | DR geometry | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Vc | fz | B* | Vc | fz | B* |
| P0 | Low-carbon steel, long-chipping, C <0.25% | <530 | <125 | – | 40–70 | 0.02–0.06 | T | 40–70 | 0.05–0.1 | A |
| P1 | Low-carbon steel, short-chipping, C <0.25% | <530 | <125 | – | 40–70 | 0.02–0.06 | T | 40–70 | 0.05–0.1 | A |
| P2 | Steel with carbon content C >0.25% | >530 | <220 | <25 | 40–70 | 0.02–0.06 | T | 40–70 | 0.05–0.1 | A |
| P3 | Alloy steel and tool steel, C >0.25% | 600–850 | <330 | <35 | 20–50 | 0.02–0.06 | T | 20–50 | 0.05–0.1 | A |
| P4 | Alloy steel and tool steel, C >0.25% | 850–1400 | 340–450 | 35–48 | 20–50 | 0.02–0.06 | T | 20–50 | 0.05–0.1 | A |
| P5 | Ferritic, martensitic and stainless PH steel | 600–900 | <330 | <35 | 15–30 | 0.02–0.04 | T | 15–30 | 0.02–0.06 | A |
| P6 | High-strength ferritic, martensitic and PH stainless steel | 900–1350 | 350–450 | 35–48 | 15–30 | 0.02–0.04 | T | 15–30 | 0.02–0.06 | A |
| M1 | Austenitic stainless steel | <600 | 130–200 | – | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |
| M2 | High-strength austenitic stainless steel | 600–800 | 150–230 | <25 | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |
| M3 | Duplex stainless steel | <800 | 135–275 | <30 | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |
| K1 | Cast iron | 125–500 | 120–290 | <32 | 50–90 | 0.02–0.06 | T | 50–90 | 0.05–0.1 | A |
| K2 | Ductile cast iron with up to medium strength | <600 | 130–260 | <28 | 40–70 | 0.02–0.06 | T | 40–70 | 0.05–0.1 | A |
| K3 | High-strength cast iron and bainitic cast iron | >600 | 180–350 | <43 | 40–70 | 0.02–0.06 | T | 40–70 | 0.05–0.1 | A |
| N1 | Wrought aluminium alloys | – | – | – | – | – | | – | – | |
| N2 | Aluminium alloys with low Si content | – | – | – | – | – | | – | – | |
| N3 | Aluminium alloys with high Si content | – | – | – | – | – | | – | – | |
| N4 | Copper, brass and zinc base | – | – | – | – | – | | – | – | |
| S1 | Iron-based heat-resistant alloys | 500–1200 | 160–260 | 25–48 | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |
| S2 | Cobalt-based heat-resistant alloys | 1000–1450 | 250–450 | 25–48 | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |
| S3 | Nickel-based heat-resistant alloys | 600–1700 | 160–450 | <48 | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |
| S4 | Titanium and titanium alloys | 900–1600 | 300–400 | 33–48 | 10–20 | 0.02–0.04 | T | 10–20 | 0.02–0.06 | A |

* coating for blades

# SETTING THE CHAMFER DIAMETER




The desired chamfer diameter **D** is determined by the setting diameter **D2**. The maximum D2 must not be exceeded (see tool tables starting on page 112)

D2 = setting diameter
D = chamfer diameter
S = control surface width

**Formula for setting chamfer diameter**
D2 ≈ D + 2S

**Procedure**
Turn the adjusting screw using an Allen key until the desired setting diameter D2 is reached. To do this, remove the red thread locker.

**Increase D2** = turn adjusting screw anti-clockwise. Secure the adjusting screw again by using locking varnish.

**Reduce D2** = turn adjusting screw to the right. Secure the adjusting screw again by using locking varnish.

If the chamfer diameter D deviates slightly from the desired diameter, the setting diameter D2 can be adjusted accordingly.

Operating instructions

> Setting the chamfer Ø and the blade force

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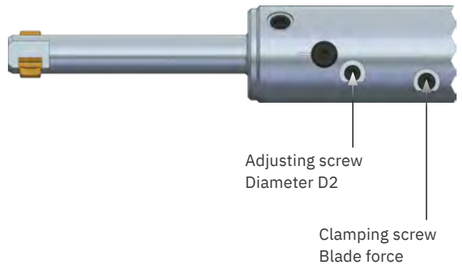
# SETTING THE BLADE FORCE




The force acting radially on the blades should be at least high enough to ensure that the blades reliably extend to the set D2 under working conditions (dirt, coolant, etc.).

**Important:** The blade force does not define the chamfer size!

**Procedure**
Blade force guide value 8-12 N. Influencing factors such as material and chamfer requirements must be considered. A test bore is recommended.

**Increase blade force** = turn clamping screw clockwise

**Reduce blade force** = turn clamping screw anti-clockwise


DEFA

# Selecting the correct DEFA tool

## TOOL SELECTOR

**The HEULE Tool Selector is the quickest and easiest way to find the right tool.**

Send your search results along with your application data to your HEULE representative. They will check the application and offer you options if required.

If your search produces no results, please contact HEULE with your application data anyway. We also develop customised solutions and are happy to advise you.

## TOOL TABLES

The correct tool is primarily determined by the bore diameter to be machined. This table also shows the chamfer diameter range, the working lengths and the tool diameters.

The tool tables cover the standard range. The tool part numbers highlighted in green are available from stock.

If the standard does not fit your needs, please do not hesitate to contact your HEULE representative for advice, either using the enquiry form (www.heule.com > contact) or by telephone.

### Tool Selector

> Step-by-step guide to find the right solution

heule.com/en/tool-selector/defa

Tool Selector

### Still have questions?

> HEULE Consulting and Support

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## CONFIGURING DEFA TOOLS

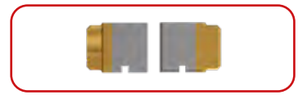
**1. Select tool**

Select the tool from the tool table that is suitable for the existing bore diameter and the intended chamfer diameter. The working length must also be selected. Depending on the bore depth, select the working length as short as possible or only as long as necessary (stability).

**2. Select shank type**

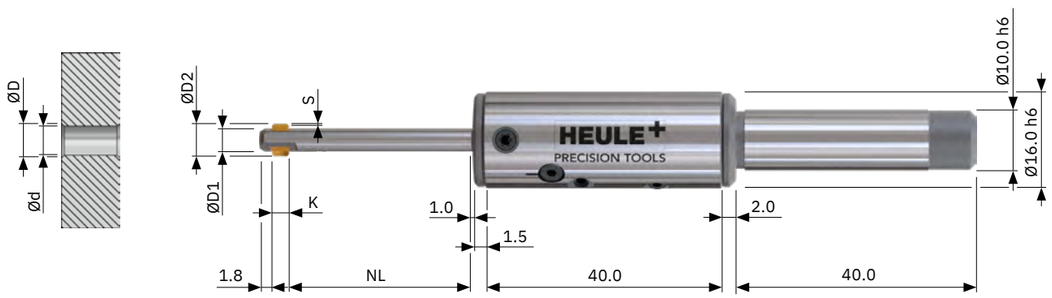
The tool can be clamped directly on the tool body or on the separate shank. If it is clamped to the tool body, an end plug is required.

**3. Select blades**



The blade is selected in the same way as the tool for the corresponding chamfer diameter range.
Blades for a different chamfer angle or coatings for materials with increased requirements (e.g. titanium or Inconel) are available upon request.

# DEFA 4–6 Ø4.0 mm to 6.8 mm




## Tool

Standard tool **without** blades
- The blades must always be ordered separately.
- If the tool is clamped to the tool body, an end plug is required.
- Make sure the bore diameter is at least above the defined lower end of the tool range.

| Bore range Ød | Chamfer range ØD | Working length NL | Blade housing ØD1 | Max. Ø ØD2 | K | S | Part no. without shank | Part no. with shank Ø 10 | Part no. with end plug |
|---|---|---|---|---|---|---|---|---|---|
| 4.0–4.6 | 4.4–4.8 | 30.0 | 3.8 | 5.4 | 3.2 | 0.3 | GH-S-D-5200 | GH-S-D-5220 | GH-S-D-5240 |
| | | 60.0 | 3.8 | 5.4 | 3.2 | 0.3 | GH-S-D-5201 | GH-S-D-5221 | GH-S-D-5241 |
| 4.2–5.0 | 4.6–5.2 | 30.0 | 4.1 | 5.8 | 3.2 | 0.3 | GH-S-D-5202 | GH-S-D-5222 | GH-S-D-5242 |
| | | 60.0 | 4.1 | 5.8 | 3.2 | 0.3 | GH-S-D-5203 | GH-S-D-5223 | GH-S-D-5243 |
| 4.6–5.6 | 5.0–5.8 | 30.0 | 4.5 | 6.4 | 3.2 | 0.3 | GH-S-D-5204 | GH-S-D-5224 | GH-S-D-5244 |
| | | 60.0 | 4.5 | 6.4 | 3.2 | 0.3 | GH-S-D-5205 | GH-S-D-5225 | GH-S-D-5245 |
| 5.0–6.2 | 5.4–6.4 | 30.0 | 4.8 | 7.0 | 3.2 | 0.3 | GH-S-D-5206 | GH-S-D-5226 | GH-S-D-5246 |
| | | 60.0 | 4.8 | 7.0 | 3.2 | 0.3 | GH-S-D-5207 | GH-S-D-5227 | GH-S-D-5247 |
| 5.5–6.6 | 5.9–6.8 | 30.0 | 5.3 | 7.4 | 3.2 | 0.3 | GH-S-D-5208 | GH-S-D-5228 | GH-S-D-5248 |
| | | 60.0 | 5.3 | 7.4 | 3.2 | 0.3 | GH-S-D-5209 | GH-S-D-5229 | GH-S-D-5249 |

Parts in stock highlighted in green

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Tool Selector –
Product selection made easy
heule.com/en/tool-selector/defa



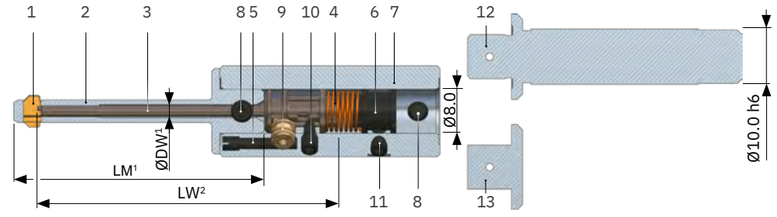


DEFA 4–6 Ø4.0 mm to 6.8 mm

## Blade set DF geometry 90°

| Chamfer Ø mm | Part no. forward and backward cutting: Coating T for steel | Part no. forward and backward cutting: Coating for increased requirements | Part no. backward cutting only: Coating T for steel | Part no. backward cutting only: Coating for increased requirements |
|---|---|---|---|---|
| 4.4–4.8 | GH-S-M-3902 | upon request | GH-S-M-4902 | upon request |
| 4.6–5.2 | GH-S-M-3903 | | GH-S-M-4903 | |
| 5.0–5.8 | GH-S-M-3904 | | GH-S-M-4904 | |
| 5.4–6.4 | GH-S-M-3905 | | GH-S-M-4905 | |
| 5.9–6.8 | GH-S-M-3906 | | GH-S-M-4906 | |

## Spare parts

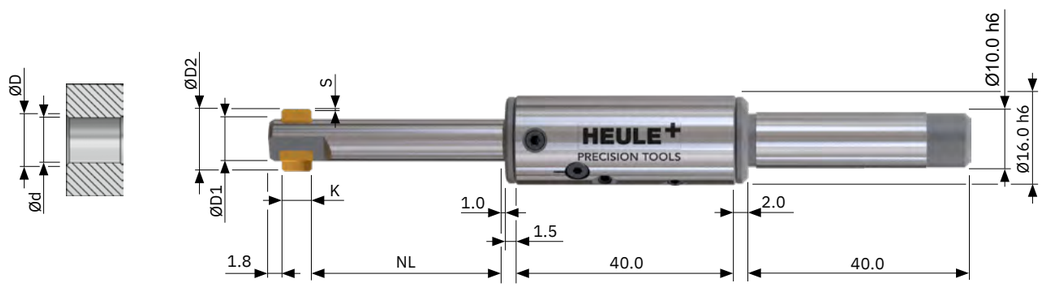



| Item | Description | Part no. |
|---|---|---|
| 1 | Blades | see above |
| 2 | Blade housing | 1) see page 118 |
| 3 | Blade control | 2) see page 118 |
| 4 | Torsion spring 4-6 | GH-S-T-0001 |
| 5 | Fixing screw 4-6 | GH-S-X-0001 |
| 6 | Clamping piece 4-6 | GH-S-C-0001 |
| 7 | Tool body 4-6 | GH-S-G-0217 |
| 8 | Clamping screw M4x0.5x5.0 | GH-H-S-0201 |
| 9 | Eccentric 4-6 | GH-S-E-0001 |
| 10 | Adjusting screw 4-6 | GH-H-S-1126 |
| 11 | Clamping screw 4-6 | GH-H-S-0101 |
| 12 | Shank cylindrical diameter 10.0 h6 | GH-S-S-0001 |
| 13 | End plug diameter 8.0 | GH-S-S-0090 |



DEFA

# DEFA 6–10 Ø6.0 mm to 10.1 mm




## Tool

Standard tool **without** blades
- The blades must always be ordered separately.
- If the tool is clamped to the tool body, an end plug is required.
- Make sure the bore diameter is at least above the defined lower end of the tool range.

| Bore range Ød | Chamfer range ØD | Working length NL | Blade housing ØD1 | Max. Ø ØD2 | K | S | Part no. without Shank | Part no. with shank Ø10 | Part no. with end plug |
|---|---|---|---|---|---|---|---|---|---|
| 6.0–6.5 | 6.2–6.8 | 34.0 | 5.8 | 7.4 | 4.0 | 0.3 | GH-S-D-5210 | GH-S-D-5230 | GH-S-D-5250 |
| | | 60.0 | 5.8 | 7.4 | 4.0 | 0.3 | GH-S-D-5211 | GH-S-D-5231 | GH-S-D-5251 |
| 6.3–7.3 | 6.5–7.6 | 34.0 | 5.8 | 8.2 | 4.0 | 0.3 | GH-S-D-5212 | GH-S-D-5232 | GH-S-D-5252 |
| | | 60.0 | 5.8 | 8.2 | 4.0 | 0.3 | GH-S-D-5213 | GH-S-D-5233 | GH-S-D-5253 |
| 6.8–8.2 | 7.0–8.5 | 34.0 | 6.5 | 9.1 | 4.0 | 0.3 | GH-S-D-5214 | GH-S-D-5234 | GH-S-D-5254 |
| | | 60.0 | 6.5 | 9.1 | 4.0 | 0.3 | GH-S-D-5215 | GH-S-D-5235 | GH-S-D-5255 |
| 7.7–9.3 | 8.1–9.6 | 34.0 | 7.5 | 10.4 | 6.0 | 0.4 | GH-S-D-5216 | GH-S-D-5236 | GH-S-D-5256 |
| | | 60.0 | 7.5 | 10.4 | 6.0 | 0.4 | GH-S-D-5217 | GH-S-D-5237 | GH-S-D-5257 |
| 8.2–10.1 | 8.9–10.4 | 34.0 | 7.5 | 11.2 | 6.0 | 0.4 | GH-S-D-5218 | GH-S-D-5238 | GH-S-D-5258 |
| | | 60.0 | 7.5 | 11.2 | 6.0 | 0.4 | GH-S-D-5219 | GH-S-D-5239 | GH-S-D-5259 |

Parts in stock highlighted in green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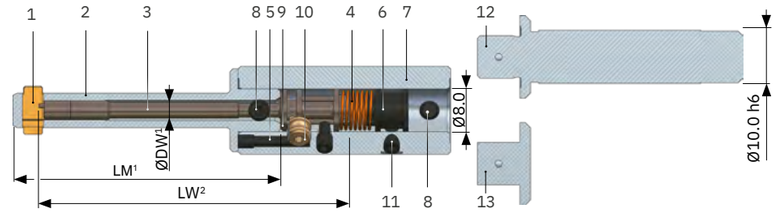
# DEFA 6–10 Ø6.0 mm to 10.1 mm


## Blade set DF geometry 90°

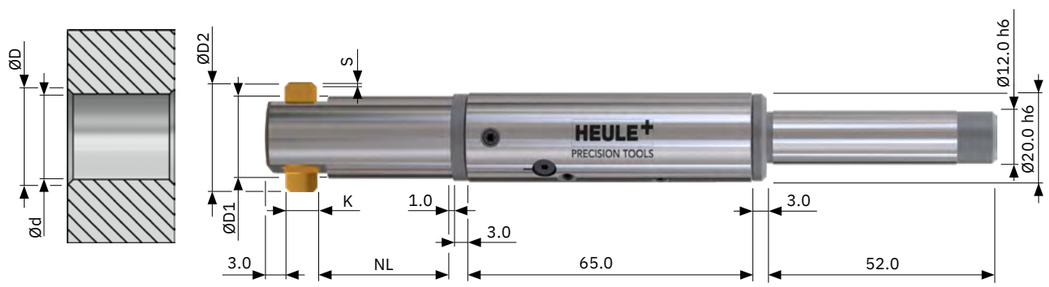
| Chamfer Ø mm | Part no. forward and backward cutting: Coating T for steel | Part no. forward and backward cutting: Coating for increased requirements | Part no. backward cutting only: Coating T for steel | Part no. backward cutting only: Coating for increased requirements |
|---|---|---|---|---|
| 6.2–6.8 | GH-S-M-3907 | upon request | GH-S-M-4907 | upon request |
| 6.5–7.6 | GH-S-M-3908 | | GH-S-M-4908 | |
| 7.0–8.5 | GH-S-M-3909 | | GH-S-M-4909 | |
| 8.1–9.6 | GH-S-M-3910 | | GH-S-M-4910 | |
| 8.9–10.4 | GH-S-M-3911 | | GH-S-M-4911 | |

## Spare parts




| Item | Description | Part no. |
|---|---|---|
| 1 | Blades | see above |
| 2 | Blade housing | 1) see page 118 |
| 3 | Blade control | 2) see page 118 |
| 4 | Torsion spring 6-10 | GH-S-T-0001 |
| 5 | Fixing screw 6-10 | GH-S-X-0001 |
| 6 | Clamping piece 6-10 | GH-S-C-0001 |
| 7 | Tool body 6-10 | GH-S-G-0217 |
| 8 | Clamping screw M4x0.5x5.0 | GH-H-S-0201 |
| 9 | Eccentric 6-10 | GH-S-E-0001 |
| 10 | Adjusting screw 6-10 | GH-H-S-1126 |
| 11 | Clamping screw 6-10 | GH-H-S-0101 |
| 12 | Shank cylindrical diameter 12.0 h6 | GH-S-S-0001 |
| 13 | End plug diameter 10.0 h6 | GH-S-S-0090 |

# DEFA 9–24 Ø9.0 mm to 23.9 mm




## Tool

Standard tool **without** blades
- The blades must always be ordered separately.
- If the tool is clamped to the tool body, an end plug is required.
- Make sure the bore diameter is at least above the defined lower end of the tool range.

| Bore range Ød | Chamfer range ØD | Working length NL | Blade housing ØD1 | Max. Ø ØD2 | K | S | Part no. without Shank | Part no. with shank Ø10 | Part no. with end plug |
|---|---|---|---|---|---|---|---|---|---|
| 9.0–11.7 | 10.2–11.4 | 30.0 | 8.8 | 12.2 | 6.0 | 0.4 | GH-S-D-1707 | GH-S-D-1747 | GH-S-D-5260 |
| | *11.1–12.0*[EF] | 60.0 | 8.8 | *12.8*[EF] | 6.0 | 0.4 | GH-S-D-1708 | GH-S-D-1748 | GH-S-D-5261 |
| 9.7–12.7 | 11.0–12.4 | 30.0 | 9.5 | 13.2 | 6.0 | 0.4 | GH-S-D-1709 | GH-S-D-1749 | GH-S-D-5262 |
| | *12.1–13.0*[EF] | 60.0 | 9.5 | *13.8*[EF] | 6.0 | 0.4 | GH-S-D-1710 | GH-S-D-1750 | GH-S-D-5263 |
| 11.2–14.3 | 12.0–13.8 | 30.0 | 11.0 | 14.8 | 8.0 | 0.5 | GH-S-D-1711 | GH-S-D-1751 | GH-S-D-5264 |
| | *13.4–14.6*[EF] | 60.0 | 11.0 | *15.6*[EF] | 8.0 | 0.5 | GH-S-D-1712 | GH-S-D-1752 | GH-S-D-5265 |
| 12.2–15.9 | 13.5–15.4 | 30.0 | 11.0 | 16.4 | 8.0 | 0.5 | GH-S-D-1713 | GH-S-D-1753 | GH-S-D-5266 |
| | *15.0–16.2*[EF] | 60.0 | 11.0 | *17.2*[EF] | 8.0 | 0.5 | GH-S-D-1714 | GH-S-D-1754 | GH-S-D-5267 |
| 13.2–17.3 | 15.1–16.6 | 30.0 | 13.0 | 17.6 | 8.0 | 0.5 | GH-S-D-1695 | GH-S-D-1788 | GH-S-D-5268 |
| | *16.4–17.6*[EF] | 60.0 | 13.0 | *18.6*[EF] | 8.0 | 0.5 | GH-S-D-1715 | GH-S-D-1755 | GH-S-D-5269 |
| 15.2–18.7 | 16.7–18.2 | 30.0 | 15.0 | 19.2 | 8.0 | 0.5 | GH-S-D-1696 | GH-S-D-1789 | GH-S-D-5270 |
| | *17.8–19.0*[EF] | 60.0 | 15.0 | *20.0*[EF] | 8.0 | 0.5 | GH-S-D-1716 | GH-S-D-1756 | GH-S-D-5271 |
| 16.7–21.5 | 18.2–20.4 | 30.0 | 16.5 | 22.4 | 8.0 | 1.0 | GH-S-D-1697 | GH-S-D-1790 | GH-S-D-5272 |
| | *19.6–21.8*[EF] | 60.0 | 16.5 | *23.8*[EF] | 8.0 | 1.0 | GH-S-D-1717 | GH-S-D-1757 | GH-S-D-5273 |
| 18.7–23.9 | 20.6–22.8 | 30.0 | 18.5 | 24.8 | 8.0 | 1.0 | GH-S-D-1698 | GH-S-D-1791 | GH-S-D-5274 |
| | *22.0–24.2*[EF] | 60.0 | 18.5 | *26.2*[EF] | 8.0 | 1.0 | GH-S-D-1718 | GH-S-D-1758 | GH-S-D-5275 |

[EF] Extended chamfer range possible: Part no. with "-EF" (example: GH-S-D-1747-EF for chamfer range 11.1-12.0 instead of 10.2-11.4).

Parts in stock highlighted in green


Programming
Page 107

Cutting data
Page 107

Tool Selector –
Product selection made easy
heule.com/en/tool-selector/defa



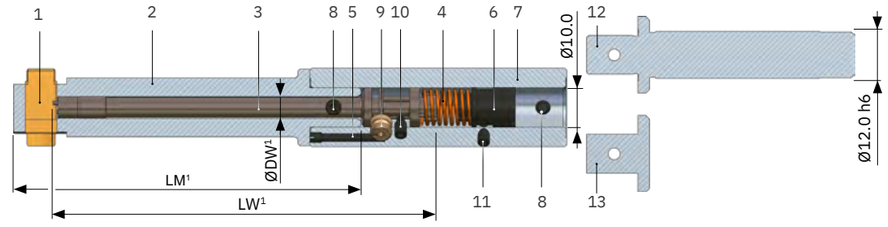



# DEFA 9–24 Ø9.0 mm to 23.9 mm

## Blade set DF geometry 90°

| Chamfer range mm | Part no. forward and backward cutting | | Part no. backward cutting only | |
|---|---|---|---|---|
| | Coating T for steel | Coating for increased requirements | Coating T for steel | Coating for increased requirements |
| 10.2–11.4 / *11.1–12.0*[EF] | GH-S-M-3912 | upon request | GH-S-M-4912 | upon request |
| 11.0–12.4 / *12.1–13.0*[EF] | GH-S-M-3913 | | GH-S-M-4913 | |
| 12.0–13.8 / *13.4–14.6*[EF] | GH-S-M-3914 | | GH-S-M-4914 | |
| 13.5–15.4 / *15.0–16.2*[EF] | GH-S-M-3915 | | GH-S-M-4915 | |
| 15.1–16.6 / *16.4–17.6*[EF] | GH-S-M-3916 | | GH-S-M-4916 | |
| 16.7–18.2 / *17.8 –19.0*[EF] | GH-S-M-3917 | | GH-S-M-4917 | |
| 18.2–20.4 / *19.6–21.8*[EF] | GH-S-M-3918 | | GH-S-M-4918 | |
| 20.6–22.8 / *22.0–24.2*[EF] | GH-S-M-3919 | | GH-S-M-4919 | |

## Spare parts




| Item | Description | Part no. |
|---|---|---|
| 1 | Blades | see above |
| 2 | Blade housing | 1) see page 118 |
| 3 | Blade control | 1) see page 118 |
| 4 | Torsion spring 9-28 | GH-S-T-0006 |
| 5 | Fixing screw 9-28 | GH-S-X-0006 |
| 6 | Clamping piece 9-28 | GH-S-C-0008 |
| 7 | Tool body 9-19<br>Tool body 17-24 | GH-S-G-0011<br>GH-S-G-0013 |
| 8 | Clamping screw M4x0.5x5.0 | GH-H-S-0201 |
| 9 | Eccentric 9-25 | GH-S-E-0003 |
| 10 | Adjusting screw 9-28<br>Adjusting screw extended chamfer range | GH-H-S-0325<br>GH-H-S-0302 |
| 11 | Clamping screw 9-25 | GH-H-S-0102 |
| 12 | Shank cylindrical diameter 12.0 h6 | GH-S-S-0013 |
| 13 | End plug diameter 10.0 h6 | GH-S-S-0092 |

# DEFA spare parts

| DEFA 4-6 | | | | BLADE HOUSING | | | BLADE CONTROL |
|---|---|---|---|---|---|---|---|
| Bore Ø | ØD1 | NL | LM | Part no. | ØDW | LW | Part no. |
| 4.0–4.6 | 3.8 | 30.0 | 45.5 | GH-S-N-0102 | 2.0 | 53.6 | GH-S-W-0003 |
| | | 60.0 | 75.5 | GH-S-N-0132 | 2.0 | 83.7 | GH-S-W-0027 |
| 4.2–5.0 | 4.1 | 30.0 | 45.5 | GH-S-N-0151 | 2.0 | 53.6 | GH-S-W-0003 |
| | | 60.0 | 75.5 | GH-S-N-0152 | 2.0 | 83.7 | GH-S-W-0027 |
| 4.6–5.6 | 4.5 | 30.0 | 45.5 | GH-S-N-0154 | 2.0 | 53.6 | GH-S-W-0003 |
| | | 60.0 | 75.5 | GH-S-N-0155 | 2.0 | 83.7 | GH-S-W-0027 |
| 5.0–6.2 | 4.8 | 30.0 | 45.5 | GH-S-N-0107 | 2.0 | 53.6 | GH-S-W-0003 |
| | | 60.0 | 75.5 | GH-S-N-0134 | 2.0 | 83.7 | GH-S-W-0027 |
| 5.5–6.6 | 5.3 | 30.0 | 45.5 | GH-S-N-0109 | 2.0 | 53.6 | GH-S-W-0003 |
| | | 60.0 | 75.5 | GH-S-N-0135 | 2.0 | 83.7 | GH-S-W-0027 |

| DEFA 6-10 | | | | BLADE HOUSING | | | BLADE CONTROL |
|---|---|---|---|---|---|---|---|
| Bore Ø | ØD1 | NL | LM | Part no. | ØDW | LW | Part no. |
| 6.0–6.5 | 5.8 | 34.0 | 50.3 | GH-S-N-0011 | 3.6 | 57.4 | GH-S-W-0505 |
| | | 60.0 | 76.3 | GH-S-N-0036 | 3.6 | 83.4 | GH-S-W-0528 |
| 6.3–7.3 | 5.8 | 34.0 | 50.3 | GH-S-N-0111 | 3.6 | 57.4 | GH-S-W-0505 |
| | | 60.0 | 76.3 | GH-S-N-0136 | 3.6 | 83.4 | GH-S-W-0528 |
| 6.8–8.2 | 6.5 | 34.0 | 50.3 | GH-S-N-0013 | 3.6 | 57.4 | GH-S-W-0505 |
| | | 60.0 | 76.3 | GH-S-N-0137 | 3.6 | 83.4 | GH-S-W-0528 |
| 7.7–9.3 | 7.5 | 34.0 | 52.3 | GH-S-N-0117 | 3.6 | 57.4 | GH-S-W-0505 |
| | | 60.0 | 78.3 | GH-S-N-0138 | 3.6 | 83.4 | GH-S-W-0528 |
| 8.2–10.1 | 7.5 | 34.0 | 52.3 | GH-S-N-0084 | 3.6 | 57.4 | GH-S-W-0505 |
| | | 60.0 | 78.3 | GH-S-N-0085 | 3.6 | 83.4 | GH-S-W-0528 |

| DEFA 9-24 | | | | BLADE HOUSING | | | BLADE CONTROL |
|---|---|---|---|---|---|---|---|
| Bore Ø | ØD1 | NL | LM | Part no. | ØDW | LW | Part no. |
| 9.0–11.7 | 8.8 | 30.0 | 56.0 | GH-S-N-0074 | 4.5 | 65.8 | GH-S-W-0508 |
| | | 60.0 | 86.0 | GH-S-N-0075 | 4.5 | 95.8 | GH-S-W-0509 |
| 9.7–12.7 | 9.5 | 30.0 | 56.0 | GH-S-N-0120 | 4.5 | 65.8 | GH-S-W-0508 |
| | | 60.0 | 86.0 | GH-S-N-0121 | 4.5 | 95.8 | GH-S-W-0509 |
| 11.2–14.3 | 11.0 | 30.0 | 58.0 | GH-S-N-0022 | 5.5 | 65.8 | GH-S-W-0511 |
| | | 60.0 | 88.0 | GH-S-N-0023 | 5.5 | 95.8 | GH-S-W-0512 |
| 12.2–15.9 | 11.0 | 30.0 | 58.0 | GH-S-N-0122 | 5.5 | 65.8 | GH-S-W-0511 |
| | | 60.0 | 88.0 | GH-S-N-0123 | 5.5 | 95.8 | GH-S-W-0512 |
| 13.2–17.3 | 13.0 | 30.0 | 58.0 | GH-S-N-0124 | 5.5 | 65.8 | GH-S-W-0511 |
| | | 60.0 | 88.0 | GH-S-N-0125 | 5.5 | 95.8 | GH-S-W-0512 |
| 15.2–18.7 | 15.0 | 30.0 | 58.0 | GH-S-N-0126 | 5.5 | 65.8 | GH-S-W-0511 |
| | | 60.0 | 88.0 | GH-S-N-0127 | 5.5 | 95.8 | GH-S-W-0512 |
| 16.7–21.5 | 16.5 | 30.0 | 58.0 | GH-S-N-0128 | 8.0 | 65.8 | GH-S-W-0520 |
| | | 60.0 | 88.0 | GH-S-N-0129 | 8.0 | 95.8 | GH-S-W-0521 |
| 18.7–23.9 | 18.5 | 30.0 | 58.0 | GH-S-N-0130 | 8.0 | 65.8 | GH-S-W-0520 |
| | | 60.0 | 88.0 | GH-S-N-0131 | 8.0 | 95.8 | GH-S-W-0521 |





# DEFA FAQ

| Question | Causes | Remedy |
|---|---|---|
| Chamfer diameter too small | • D2 set too small | • Turn the adjusting screw anti-clockwise (see Adjusting the chamfer diameter on page 108) |
| Chamfer diameter too large | • D2 set too large | • Turn the adjusting screw clockwise (see Adjusting the chamfer diameter on page 108) |
| Chamfer not even | • Blade force too low | • Turn the clamping screw clockwise (see Setting the blade force page 109) |
| | • Tool not centred in the bore | • Align tool |
| Chamfered surface poor | • Working feed rate too high | • Reduce working feed rate |
| | • Blade wear | • Resharpening, TiN coating or new blades |
| Secondary burr | • Working feed rate too high | • Reduce working feed rate |
| | • Blade force too strong | • Turn the clamping screw anti-clockwise (see Setting the blade force page 109) |
| | • Tool not centred in the bore | • Align tool |
| | • Blade wear | • Resharpening, TiN coating or new blades |
| | • Cutting speed too low | • Increase cutting speed |